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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,243	07/17/2003	Ashish D. Alawani	0140111	2882

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EXAMINER

LEVI, DAMEON E

ART UNIT PAPER NUMBER

2841

DATE MAILED: 11/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/623,243

Applicant(s)

ALAWANI ET AL.

Examiner

Dameon E Levi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4,6-13,15-17,19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rostoker et al US Patent 5399903 in view of Dory et al US Patent 6614122.

Regarding claim 1, Rostoker et al discloses a module comprising:

a surface mount component situated over a substrate, the surface mount component comprising a first terminal and a second terminal(for example, see elements 152,154,146, Figs 1-6)

a first and a second pad situated on the substrate, the first pad being connected to the first terminal and the second pad being connected to the second terminal(for example, see elements 148A,148B,154,146, Figs 1-6)

a solder mask trench situated underneath the surface mount component, the solder mask trench being filled with molding compound(for example, see elements 152,154,148C,150, Figs 1-6)

Rostoker et al does not expressly disclose the solder mask trench formed within the solder mask.

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Dory et al discloses a device comprising a solder mask trench formed within the solder mask (for example, see elements 208,210,310, 308, Figs 1A- 3G).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the trench within the solder mask as taught by Dory et al in the device as taught by Rostoker et al for the purpose of controlling the flow of the underfill or molding compound(see Dory et al)

Regarding claim 2 Rostoker et al discloses further comprising a moldable gap situated between a bottom surface of the surface mount component and a top surface of the substrate, the moldable gap including the solder mask trench (for example, see elements 150, Figs 1-6).

Regarding claim 3, Rostoker et al discloses wherein the moldable gap is filled with the molding compound(for example, see elements 150, Figs 1-6, see column 9, lines 40-45).

Regarding claim 4, Rostoker et al discloses further comprising an overmold, the overmold being situated over the surface mount component (for example, see element 28, Fig 1A, see column 10, lines 12-15).

Regarding claim 6, Rostoker et al discloses wherein the moldable gap has a height of between approximately 45.0 micrometers and 65.0 micrometers (for example, see Figs 1A-6).

Regarding claim 7, Rostoker et al discloses wherein the overmolded module is an MCM(for example, see Figs 1A-6).

Regarding claim 8, Rostoker e al discloses wherein the substrate comprises a

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laminate circuit board (for example, see Figs 1A-6, see column 10, lines 5-12).

Regarding claim 9, Rostoker discloses a module comprising:

a surface mount component situated over a substrate, the surface mount component comprising a first terminal and a second terminal (for example, see elements 152, 154, 146, Figs 1-6)

a first and a second pad situated on the substrate, the first pad being connected to the first terminal and the second pad being connected to the second terminal (for example, see elements 148A, 148B, 154, 146, Figs 1-6)

a moldable gap situated underneath the surface mount component, the moldable gap comprising a solder mask trench, the solder mask trench being filled with molding compound (for example, see elements 152, 154, 148C, 150, Figs 1-6)

Rostoker et al does not expressly disclose the solder mask trench formed within the solder mask.

Dory et al discloses a device comprising a solder mask trench formed within the solder mask (for example, see elements 208, 210, 310, 308, Figs 1A- 3G).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the trench within the solder mask as taught by Dory et al in the device as taught by Rostoker et al for the purpose of controlling the flow of the underfill or molding compound (see Dory et al)

Regarding claim 10, Rostoker et al discloses wherein the moldable gap is filled with the molding compound (for example, see elements 150, Figs 1-6, see column 9, lines 40-45).

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Regarding claim 11, Rostoker et al discloses further comprising an overmold, the overmold being situated over the surface mount component(for example, see element 28, Fig 1A, see column 10, lines 12-15).

Regarding claim 12, Rostoker et al discloses wherein the overmold comprises the molding compound(for example, see element 28, Fig 1A, see column 10, lines 12-15).

Regarding claim 13, Rostoker et al discloses herein the moldable gap has a height of between approximately 45.0 micrometers and 65.0 micrometers(for example, see Figs 1A-6).

Regarding claim 15, Rostoker et al discloses wherein the overmolded module is an MCM(for example, see Figs 1A-6).

Regarding claim 16, Rostoker et al discloses a module comprising:

a surface mount device situated over a substrate, the surface mount device comprising a plurality of terminals(for example, see elements 152,154,146, Figs 1-6)

a plurality of pads situated on the substrate, each of the plurality of pads being connected to a respective one of the plurality of terminals(for example, see elements 148A,148B,154,146, Figs 1-6)

a solder mask trench situated underneath the surface mount device, the solder mask trench being filled with molding compound(for example, see elements 152,154,148C,150, Figs 1-6)

Rostoker et al does not expressly disclose the solder mask trench formed within the solder mask.

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Dory et al discloses a device comprising a solder mask trench formed within the solder mask (for example, see elements 208,210,310, 308, Figs 1A- 3G).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the trench within the solder mask as taught by Dory et al in the device as taught by Rostoker et al for the purpose of controlling the flow of the underfill or molding compound(see Dory et al)

Regarding claim 17, Rostoker et al discloses wherein the surface mount device is a leaded surface mount device(for example, see elements 152,22,52',52",52, Figs 1A-6).

Regarding claim 19, Rostoker et al discloses wherein the surface mount device comprises at least one component, the at least one component being selected from the group consisting of an active component and a passive component(for example, see elements 152,22,52',52",52, Figs 1A-6).

Regarding claim 20, Rostoker et al discloses wherein the overmolded module is an MCM(for example, see Figs 1A-6).

Claims 5,14,18 rejected under 35 U.S.C. 103(a) as being unpatentable over Rostoker et al US Patent 5399903 in view of Dory et al US Patent 6614122 and further in view of Anderson et al US Patent 5969461.

Regarding claim 5, Rostoker et al and Dory et al discloses the instant claimed invention except wherein the surface mount component is selected from the group consisting of a resistor, a capacitor, an inductor, a diplexer, a diode, and a SAW filter.

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Anderson et al discloses a module wherein a surface mount component is selected from the group consisting of a resistor, a capacitor, an inductor, a diplexer, a diode, and a SAW filter (for example, see element 10, Figs 1-3, see columns 1-9)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a surface mount component as specifically taught in Anderson et al in the module as taught by Rostoker et al and Dory et al as such surface mount devices are well known in the art.

Regarding claim 14, Rostoker et al and Dory et al discloses the instant claimed invention except wherein the surface mount component is selected from the group consisting of a resistor, a capacitor, an inductor, a diplexer, a diode, and a SAW filter.

Anderson et al discloses a module wherein a surface mount component is selected from the group consisting of a resistor, a capacitor, an inductor, a diplexer, a diode, and a SAW filter (for example, see element 10, Figs 1-3, see columns 1-9)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a surface mount component as specifically taught in Anderson et al in the module as taught by Rostoker et al and Dory et al as such surface mount devices are well known in the art.

Regarding claim 18, Rostoker et al and Dory et al discloses the instant claimed invention except wherein the surface mount device is a leadless surface mount device.

Anderson et al discloses a leadless surface mount device (for example, see element 10, Figs 1-3)

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a leadless surface mount device as taught by Anderson et al in the device as taught by Rostoker et al and Dory et al such devices are known in the art.

Response to Arguments

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dameon E Levi whose telephone number is (571) 272-2105. The examiner can normally be reached on Mon.-Fri. (9:00 - 5:00).

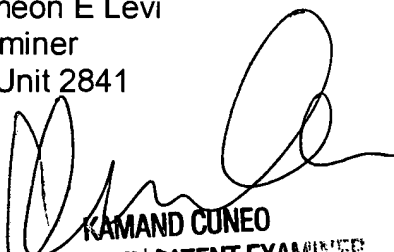
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DEL

Dameon E Levi
Examiner
Art Unit 2841



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